Pearson, George

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COMMUNICATIONS

TO

DR. ROLLO'S WORK

ON

DIABETES,

FROM DR. PEARSON,

Phyſician to St. George's Hoſpital, Lecturer on the Practice of Phyſic and Chemiſtry, &c. London.

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CASE I.

H. Laurie, aged thirty-eight years, a cabinet-maker, became my patient, July 21, 1791. He had been ill three years, according to his own account; but from the nature of the ſymptoms firſt obſerved, it ſeemed probable that he had been diſordered for a longer time. The firſt ſymptoms obſerved were an unuſual quantity of urine, loſs of fleſh, and ſickly countenance. He became gradually more emaciated, and the increaſed diſcharge of urine was permanent. He had not attended to the taſte of this excretion till eighteen months ſince, when he found it to be ſweet. Halſ a year ago the legs grew œdematous. Formerly he uſed to ſweat very freely, but of late that diſcharge had apparently ceaſed. He had had a gleet for ſome months.

The patient, who had in health been a luſty man, was now exceedingly thin; he was in a debilitated ſtate, and paſſed about nine pints of ſweet urine every 24 hours, although there was a great variation in the quantity of drink. He thought the quantity of urine was varied little by increaſing or decreaſing the quantity of drink; nay, he even ſaid the diſcharge was leſſened by increaſing it. The appetite for food was, at leaſt, as great in health as it had ever been during the whole courſe of the diſorder. The mouth had felt parched, and thirſt had ſubſiſted during great part of the illneſs.

The patient lived abſtemiouſly when in health, but during his diſorder he generally drank from two to three pints of porter daily.

It would afford no inſtruction to give a minute detail of all the medicines preſcribed, the greater part of them being thoſe ſanctioned by experience, although I believe they have rarely, I had almoſt ſaid *never*, proved really efficacious. It may be of uſe to mention ſome medicines which were employed, of which we had before no experience, although they did not appear to be of any ſervice. Of this deſcription were the following.

Thirty grains of carbonate of ſoda were taken thrice every day for ten days.

Twenty to thirty drops of oil of turpentine were given three times a day for a month, during which time the urine had the ſmell of this ſubſtance.

Two grains of calomel were adminiſtered daily for two months, without affecting the mouth, ſtomach, bowels, or urinary diſcharge.

Bliſtering plaſters were applied repeatedly to the loins; and a diſcharge was alſo kept up by means of them for ſome time.

It may be proper alſo to notice the extraordinary, and almoſt incredible inexcitability of the ſtomach to antimonials, and the ſame condition of the inteſtines, although I do not know that this ſtate had any connection with the diabetic complaint. At firſt, thirty grains of pulvis antimonialis, or James's powder, were given as a vomit, but they produced neither vomiting nor ſickneſs. Forty grains of this medicine were next given in an evening; he ſlept as well as uſual, and no ſenſible effects enſued till the following morning, when both vomiting and purging came on, by which the ſtomach, which had been diſordered, was much relieved.

Thirty grains of pulvis antimonialis were adminiſtered ſome time after the former doſes; and next forty grains, at four different times, without any ſenſible effects from any of theſe doſes; excepting once vomiting; but that not without the aid of warm water, containing common ſalt. He took forty grains of this medicine one evening at eight o'clock, a ſecond ſimilar doſe at nine o'clock, and a third ſimilar doſe at ten o'clock, without any perceivable operation till one in the morning, when he grew ſick, and afterwards vomited once only.

At another time, forty grains of this antimonial preparation were given, and in one and a half hour farther, ſixty grains, upon which he vomited a little. And on another occaſion the patient took in three hours, one evening, ſix doſes of the antimonial powder, of ſixty grains in each, and ſoon after the laſt doſe he vomited about a quart of liquid, his ſtomach grew eaſy, and he could have eat at ſupper as uſual; he paſſed a quiet night, and diſcharged during it even leſs urine than uſual; the next morning ate at breakfaſt with a good appetite; and during the day purged a good deal without griping. One evening he alſo took ſix doſes of antimonial powder, of thirty grains each, in ſix hours ſucceſſively, without any ſenſible effect till next morning, when he was a little ſick, but vomited only once, although he drank warm water; and ate at breakfaſt with his uſual good appetite. Nor was the ſtomach inexcitable to antimonial powper only; it appeared that ipecacuanha, in the quantity of a tea ſpoonful, ſeldom occaſioned vomiting. It alſo appeared that he could not be purged with leſs than three ounces of ſulphate of ſoda. It may be proper to notice that there was no room for doubt as to the virtue of the pulvis antimonialis employed, becauſe this medicine, from the ſame parcel, operated on other patients in the uſual ways.

The patient diſcharged ſweet urine, in the quantity of about eight to ten pints every twenty-four hours; grew more and more emaciated, and weaker; but the anaſarcous ſwellings diſappeared, and the appetite for food continued extremely good, with conſtant thirſt, to November, 1792, when he omitted to call upon me, and I heard nothing concerning him till May following, when his wife acquainted me with his death. She informed me that he continued to diſcharge ſweet urine, and that at length his appetite failed; that he ſweated much at times, and two days before his death he grew ſick, and vomited; became inſenſible, and died in a moſt emaciated ſtate.

DISSECTION.

Mr. Edward Ford examined the body with great care. I was preſent on this occaſion, as well as two of my pupils, Mr. Warren and Mr. Hutchiſon. The kidneys were found to be in a perfectly ſound ſtate, and ſo were the ureters; but the urinary bladder was much thickened, and the urethra was dilated to three or four times its uſual width. The urine found in the bladder did not taſte ſweet; but how long before death it ceaſed to be ſweet had not been obſerved.

All the viſcera of the thorax were in a perfectly ſound ſtate; and ſo were thoſe of the abdomen, excepting the meſentery, which was very much thickened, although the glands of it were not at all diſeaſed.

Remarks.

1. In the above caſe, the Diabetes, attended with ſaccharine urine, appears to have ſubſiſted more than four years, and then proved fatal.

2. During this time, a great quantity of nutritious matter, namely, of ſugar, and probably other kinds of aſſimilable matter, was daily diſcharged with the urine.

3. During the whole courſe of the diſeaſe, except in the laſt ſtage of it, the appetite for food was conſiderable, ordinarily greater than in health, as well as the thirſt; and there was a gradual and conſtant waſte of the fleſh.

4. Accordingly, more nutritious matter appears to have been carried off by the urinary paſſages than was in proportion to the daily waſte of the animal œconomy in health; or a ſmaller propor-

tion was aſſimilated than in health; wherefore, the emaciation gradually increaſed to ſuch a degree, as to produce fatal debility.

5. In the laſt ſtage of the diſeaſe the appetite failed, and the urine ceaſed to be ſweet; and then, probably, not more food was taken than was aſſimilated, although that was a ſmaller quantity of food than in health. Sufficient attention, however, was not paid to the quantity of urine in the laſt ſtage, nor do we know whether or not it contained aſſimilable matter of a different kind from ſugar.

6. Whether the diſeaſed ſtate of the meſentery ought to be conſidered as having any ſhare in occaſioning the Diabetes, muſt be determined by future obſervations, in which attention ſhould be paid to the ſtate of this part.

7. As to the indiſpoſition of the ſtomach and bowels to be affected by antimonial medicines, ipecacuanha, and ſulphate of ſoda, as well as, perhaps, purgative ſalts of every kind, this ſtate, perhaps, was not connected with the diabetic complaint, but muſt be referred to the patient's peculiarity of conſtitution.

CASE II.

The following Caſe is tranſcribed from my Regiſter of Caſes, which I kept when I was a Pupil at St. Thomas's Hoſpital. The Patient was under the care of my late friend, Dr. RICHARD HUCK SAUNDERS.

N. CRISP, a ſhoemaker, from Beccles, aged 25 years, was admitted into the hoſpital on the 20th March. He had only noticed his diſorder fifteen months; which he obſerved to begin with thirſt, and a diſcharge of an extraordinary quantity of violet ſmelling and ſweet taſting urine. He had always lived temperately, and no cauſe could be aſſigned for his illneſs.

For the firſt ſix weeks he paſſed about ſix or ſeven wine pints of urine every twenty-four hours; the month following it increaſed to double of this quantity, that is, to twelve pints in a natural day; in ſix months he paſſed about twenty pints every twenty-four hours; and, according to the patient's account, the quantity excreted after this time, in ſix weeks, was even thirty wine pints every twenty-four hours, for two months; at the end of this time the urine decreaſed to twenty pints in a natural day, and ſoon after to ſixteen pints; which quantity he continued to excrete the whole time he was in the hoſpital. The urine was uniformly ſweet. His drink was ſage-tea, barley-water, beer, milk, and water; it was eſtimated to be nearly equal to the quantity of urine. He was a good deal reduced in point of fleſh. The gums appeared to have been abſorbed, or worn away, and ſeveral of his teeth had grown looſe, and been taken out.

During the laſt five months, a cataract had taken place in both eyes. I do not relate the treatment, becauſe I ſend you the account of it in Dr. HUCK SAUNDERS's own writing, which he was ſo kind as to tranſcribe for me from his Hoſpital Caſe Book, the patient having been under his care for ſome time before I attended.

The urine, I have ſaid, was conſtantly ſweet, and in warm weather I obſerved that it evidently began to undergo the vinous fermentation. He ſweat profuſely during the Summer. The pulſe varied between 70 and 108. The appetite during the whole illneſs had been at leaſt as great as in health, and while he was in the hoſpital it was voracious. He was treated in the hoſpital for five months without receiving any benefit, and then he was diſcharged, but leſs emaciated and reduced in ſtrength than might have been expected.

DOCTOR HUCK SAUNDERS's *Account.*

On the 20th March he was ordered a milk diet, half a drachm of rhubarb twice a week, which was continued to the 6th of June. He was at the ſame time ordered dec. cort. Peruv. ℥ij. cum tinct. cort. Peruv. ſimpl. ʒj. ſextis horis; to each doſe of which was added (16th May) ten grains of alum. This preſcription was continued to the 6th of June, without any very remarkable effect, only his ſtrength was increaſed, *his appetite was good, but his thirſt did not decreaſe.* On the 18th of May he complained of a cough, with a thin defluxion on his cheſt, for which he took the lohoc cum olibano, till the 9th of May, when he had no further occaſion for it. His urine was ſtill about ten quarts in a natural day. The mel roſac. cum tinct. myrrh. was ordered on the 9th of May for the eroſion of his gums, and left off about the 6th of June, when that ſymptom was pretty well removed. On the 6th of June he began to take thirty drops of tinct. cantharid. bis die, and had increaſed the doſe to one hundred by the 13th. From this day to the 11th of July he took one hundred drops thrice a day; and from the 11th of July to the 1ſt of Auguſt, one hundred and twenty per diem. Beſides this medicine, he took ſeri alumin. ℥ iv. bis die the 4th July to 1ſt of Auguſt. His urine, which amounted to ten quarts daily on the 6th of June, was not more than eight on the 20th of June, and never came down lower whilſt he remained in the hoſpital. On the 1ſt of Auguſt he began to take ten grains of the powder of galls thrice a day, which he did to the 15th, when he left the hoſpital, deſpairing of a cure, as he had met with ſo little relief in it. He continued, or was ordered to continue, the milk diet all the time.

Remarks.

1. We do not know the iſſue of this caſe, but it can ſcarce be doubted that it terminated fatally.

2. The progreſs of the emaciation was ſlower, although the quantity of ſweet urine was greater, than in the former caſe.

3. As in the former caſe, the urine was conſtantly ſaccharine, and the appetite was greater than in health, although the patient kept loſing fleſh.

4. It does not appear that the urine was in greater quantity than the drink, nor that the diſcharge by the ſkin was leſſened. As in the former caſe, no cauſe could be aſſigned for the diſeaſe.

5. Notwithſtanding the long continued treatment directed by one of the moſt experienced, ſkilful, and attentive phyſicians in London, no

ground was gained; on the contrary, the conſtitution grew more diſeaſed. The various remedies employed you will find in this phyſician's own ſtatement, and it is but juſtice to ſay,

——Si pergama dextrâ
Defendi poſſent, etiam hac defenſa fuiſſent.

6. From the uniformity in the quantity of urine for ſo many weeks together, it does not ſeem probable that water was abſorbed by the ſkin; for in that caſe, we might expect it to vary according to the humidity or dryneſs of the air.

CASE III.

July, 1798.

A *Gentleman*, aged about 56 years, who had lived rather in a ſedentary manner, was troubled for five ſucceſſive winters with a cough, attended by a copious ſpitting. In the Summer he was almoſt free from theſe ailments. During the two laſt of theſe winters ſymptoms appeared, which, it was apprehended were thoſe produced by pulmonary tubercles and vomicæ.

In the early part of the Summer ſucceeding the fifth Winter, namely, in May, 1797, when the patient was conſidered as labouring under the chronic kind of pulmonary phthiſis, beſides taking the uſual medicines in ſuch diſorders, he began to breathe hydrocarbonate gas; which was adminiſtered to him by Dr. Thornton. Soon after the uſe of this medicine, he experienced a very deciſive amendment of his pulmonary diſorder; and continued almoſt entirely free from cough, ſpitting, and difficulty of breathing, the whole of the Summer; nor did theſe complaints return in October following, as they had conſtantly done for ſeveral preceding years.

In October laſt it was obſerved that, notwithſtanding the amendment of the diſorder of the cheſt, a gradual waſting of the fleſh had taken place; ſo that inſtead of being, as in health, muſcular, and rather corpulent, his body was become thin, and his limbs were emaciated. The appetite continued to be as great, and was frequently greater than in health. The pulſe at the wriſt was moſt commonly about 80 in a minute, and never exceeded that number. The tongue had a healthy appearance, and there was pretty conſtantly thirſt. The patient had ſweat profuſely for the whole preceding year.

I now learnt that he had been accuſtomed, for five or ſix years paſt, to drink to the amount of from five to eight pints of liquids, ſuch as tea, capillaire, ſmall beer, wine, water, coffee, &c. in the ſpace of every twenty-four hours. A

proportional

proportional quantity of urine was diſcharged; that is, as much urine, or thereabouts, as he had taken of drink. As will be expected, the night-reſt was diſturbed by riſing to paſs urine. The quantity of urine being at firſt attended to without reckoning the quantity of drink; and being perceived by the attendants to be ſometimes ſweet to the taſte, the patient was pronounced to labour under the Diabetes. The urine alſo having been taſted by a perſon of unqueſtionable accuracy, it was diſcovered to be ſaccharine. A parcel which I examined was not deciſively ſweet, but I was ſtruck with a ſmell which I had never perceived on any former occaſion, namely, that of ſtale beer. Half a pint of this urine, on evaporation, yielded 400 grains of extract-like matter, which contained no ſugar perceivable by the taſte. Another parcel of the ſame urine, on ſtanding ten days in a warm room, in a three pint bottle, which was half full, and cloſed with a glaſs ſtopper, became covered with a white ſcum, and a depoſit took place of ſeemingly the ſame ſort of matter; but the urine itſelf, which was quite clear, ſmelled ſtrongly of vinegar, and taſted ſouriſh. On diſtillation, this ſour urine afforded three-fourths of an ounce of liquid acetous acid, of nearly the ſtrength of weak diſtilled vinegar. It may be uſeful to notice that the patient had lived principally on animal food for ſeveral months, and had drunk a pint of wine daily, inſtead of a larger quantity, as was his cuſtom before his illneſs. During my attendance occaſionally for three months, the urine generally had the beer ſmell, and on ſtanding became ſour. Two or three different times it had however, undoubtedly, the ſaccharine taſte. Some parcels of this patient's urine, which had a fleſhy and beeriſh ſmell, happening to ſtand in a cloſe veſſel, in a warm room, from November, 1797, to May following, not one of them had the uſual ſmell of urine of perſons in health, nor of putrid urine; but either ſmelled ſouriſh, or muſty; and they depoſited lees, and were covered with white ſcum. The urine of the patient, however, ſometimes ſmelt like ordinary urine; but on keeping it did not grow fœtid, nor acquire an animal odour; nor did it ferment, and became ſour. It was alſo found that this laſt mentioned ſort of urine retained the uſual aceſcency of urine of healthy perſons, as betrayed by the teſt of turnſole, even after keeping in a warm room ſix months. In other properties, the urine of the patient agreed with that of people in health, namely, in depoſiting, during repoſe, cryſtals of uric * oxide, in containing ſuper-phoſphat of lime, phoſphate of ammoniac, muriate of ſoda, &c.

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* See Philoſ. Tranſ. for 1798, Part I. p. 15. A paper on urinary concretion.

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The patient was directed to live four days entirely on vegetable food. The urine during this time proved ſo irritating to the urethra and glans penis, as to inflame them, and a little of it was even paſſed involuntarily. It was obſerved that the urine excreted during the uſe of this kind of food, contained none of the uric oxide, which is the uſual baſis of urinary concretions. According to my obſervation the urine voided, when the food was entirely animal matter, was equally aceſcent, and fermentable into vinegar, as when it was entirely vegetable matter.

The quantity of urine, in October and November laſt, never exceeded, according to eſtimation, the quantity of drink; and the quantity of urine ſeemed to vary proportionally, or nearly ſo, as the quantity of liquor varied.

Except ſome ſlight incidental colds, the patient was quite free from pulmonic complaints the whole of the laſt Winter, as well as during the preſent Summer. The thirſt has abated a little; the appetite for food has been of late about the ſame as it was in health, inſtead of being greater than formerly. The pulſe at the wriſt has varied between 70 and 80 in a minute. The waſting of the fleſh has ſcarce continued to go on of late, and the ſtrength has decreaſed very little for ſeveral months paſt. The urine, however, does not appear to have diminiſhed in quantity, nor to have been altered in its properties, in proportion to the general amendment.

The amount of this excretion has been for ſome months, at leaſt, five to ſix pints in the ſpace of twenty-four hours. It ſtill commonly has a beeriſh ſmell, and on ſtanding in a warm room does not ordinarily ſmell urinous, and putrefy like common urine, but becomes aceſcent, and depoſits lees, and throws up ſcum as malt liquor does, on growing ſour. There is no room to ſuppoſe that the quantity of urine exceeds the quantity of drink.

The patient has continued to live almoſt entirely on animal food, even breakfaſting uſually on what is called *beef-tea*, in place of the vegetable matter commonly taken at this meal. When vegetable ſubſtances were occaſionally taken as food, the urine was increaſed in quantity, but no effects were otherwiſe experienced different from thoſe during the uſe of animal food. It was thought adviſeable to continue, however, the animal food, as it agreed very well with the patient, and as the urine was leſs in quantity than when vegetable food was taken.

I think it quite uſeleſs to relate particularly the medicines which were preſcribed for the entire cure of the diabetic tabes, becauſe there appeared good good reaſons for diſtruſting their efficacy. I think it likewiſe unneceſſary to relate, particularly, the medicines which were preſcribed as palliatives, and for incidental complaints; becauſe, although they proved effectual, yet, as they were plainly indicated by the ſymptoms, I take for granted they muſt be known to every well informed practiſer.

Remarks.

As in the malady above deſcribed the urine was not in greater quantity than the drink; as it was not in ſo great quantity as is expected to be diſcharged in Diabetes; as it had ſeldom a ſweet taſte, I am aware the propriety of calling the preſent diſtemper Diabetes will not be acknowledged by many perſons without heſitation. The conſiderations which induce me to conceive this to be an inſtance of that diſorder are, 1ſt, the great appetite for food; the conſtant thirſt for ſo long a time; the conſtantly unputreſcible, ſometimes ſaccharine urine, and which was frequently ſuſceptible of the acetous fermentation; the quantity of urine being much more than that of moſt of healthy perſons; and the gradual emaciation. From the great quantity of ſeemingly aſſimilable, or nutritious matter daily carried off with the urine; which either contained ſugar, (although not, in general, perceivable by the taſte,) or matter ſuſceptible of the acetous fermentation; and from other ſymptoms, it ſeems reaſonable to conjecture that the Diabetes in this, and other ſimilar inſtances, conſiſts in deficient powers of the organs of aſſimilation. According to this notion, Diabetes may take place without the quantity of urine being neceſſarily greater than in health, and the preſence of ſugar perceptible by the taſte may be conſidered only as caſual. Hence alſo, ſuch a diſeaſe may probably take place much more frequently than has been hitherto noticed; and ſuch are, probably, many inſtances of atrophy, or conſumption, which occur without any known local affection, in which the urine may be loaded with nutritious matter, as in the preſent inſtance.

It is plain, from theſe remarks, that I feel inclined to adopt, for the preſent, the theory you have ſo ingeniouſly framed, and ſo well ſupported by facts; namely, that Diabetes is not eſſentially a diſeaſe of the urinary organs themſelves, but of the organs of digeſtion; although you may not think as I do, that the ſeat is not in the ſtomach, but in parts leſs remote from thoſe in which aſſimilation of nutritious matter takes place.

Saccharine matter is not the immediate cauſe of Diabetes, but the effect of this diſeaſe; and if animal food is beneficial, and vegetable food is detrimental, it cannot, I think, be ſhewn, that it is becauſe the former does not afford ſugar and the latter does.

In ſupport of your theory, that the Diabetes is not ſeated in the kidneys, it may be aſſerted,

1. That the kidneys do not appear to be ſecretory organs, or organs which compound matters of a different kind from thoſe which enter into them from the blood; for excepting, perhaps, the ſecreted mucus from the urinary paſſages, there is nothing in urine that does not exiſt in the ſame ſtate of compoſition in the blood itſelf. The water and ſaline ſubſtances are all contained in the blood, and the mucilage of the urine ſeems to be the recrementitious part of the blood, mixed with ſecreted mucus of the urinary paſſages. The facility, and even rapidity, with which liquids, containing various impregnating ingredients, may be tranſmitted through the ſanguiferous ſyſtem and kidneys ſhow, that the kidneys are rather to be conſidered as *ſeparating* than *ſecreting* organs.

2. From the great relief experienced on taking a large quantity of mucilage in irritations from the urine, in various complaints of the urinary paſſages, it has been ſuppoſed the mucilage paſſes indigeſted to thoſe parts.

It has been objected to this theory, that ſugar could not be detected in the blood of patients, whoſe urine evidently contained it, and, conſequently, that it muſt have been compounded in the kidneys; but the teſt employed, namely, the taſte, does not appear adequate to the detection of the ſubſtance ſought for, and that on two accounts. 1ſt. Becauſe of its diffuſion through ſo large a proportion of liquid. 2dly. Becauſe the taſte of the ſugar may be obſcured by its intimate mixture with a variety of ſalts and mucilages of the blood. And for theſe reaſons alſo, ſugar may be preſent in the urine, and not be perceivable by the taſte, but yet it may prevent putrefaction, or render ſuch urine ſuſceptible of the acetous fermentation. It is well known that ale and other malt liquors, which are vapid, and not at all ſweet, by keeping in bottles, in a due temperature, will again ferment, ſo as to be inebriating from the alcohol, and extremely acidulous from the great quantity of carbonic acid, compounded. Theſe vapid liquors muſt, therefore, have contained either ſugar, or matter capable of becoming ſugar.

I underſtand alſo that you have made the experiment of diſſolving ſugar in ſerum of blood, and, as was to be expected, found that a certain quantity may be contained in it, and not be perceptible to the taſte; but, like other extraneous matters in the blood, this quantity, when ſeparated by the kidneys, may be ~~in~~ſufficient to give a ſweet taſte to the urine. It has been atteſted by perſons whoſe ſtatements cannot be doubted, that the blood has, in ſome inſtances of Diabetes, taſted ſweet, and that it had other properties denoting ſugar. A ſingle poſitive evidence of this ſort ought not to rejected by any number of negative ones. But, in ſhort, blood and urine to moſt perſons taſte is commonly ſomewhat ſweet; and therefore, it ſeems not improbable, that there is in general, ſugar both in the blood and urine of all animals at certain times. It is not doubted that the ſweetneſs of chyle, and of milk, is from ſugar. It ſeems alſo that the digeſtive and aſſimilating organs of animals compound ſugar from merely animal, as well as vegetable aliment; as appears on examining the chyle and milk of animals which live entirely on animal food; namely, either thoſe which are purpoſely fed, or which are naturally carnivorous. It does not ſeem that the fluids of animals which feed on ſaccharine matters, contain more ſugar than thoſe which feed on animal ſubſtances. Vegetables manured with merely animal matter contain as much ſugar in their fluids as when manured with vegetable matter, or probably with ſugar itſelf. But ſugar can alſo be compounded by fermentation, without the aid of live powers, from dead animal matter and taſteleſs farina. Theſe facts, it may be proper to notice, ſeem to juſtify the obſervation above made, that, on a theoretical ground, we might conclude that animal food was not likely to be either more beneficial, or leſs hurtful, than vegetable.

In this place it will be proper to point out, that fermentation is a more delicate criterion of the preſence of ſugar in urine than the taſte; for the urine of the above patient did not taſte ſweet, but it fermented into acetous acid.

3. As great a variety in the appearances of urine is obſerved as in the alvine excrements, but in fluids ſecreted by glands, ſuch great differences are not obſerved. Hence the urine has been juſtly called the feces of the blood. In diabetic diſorders ſome obſervers have atteſted that the urine made a few hours after a meal had a chylous appearance.

4. Various other matters beſides ſugar may be contained in the blood of certain perſons, and not be perceived by the taſte, or other ſenſes, nor even by chemical teſts, but which are very evident to the ſenſes, or to chemical teſts, in the urine of ſuch perſons. I ſhall mention a few inſtances.

The odorous matter of aſparagus was not perceived in the blood at the ſame time that the urine ſmelled ſtrongly of it. I have adminiſtered oil of turpentine to ſeveral patients in ſuch quantities, that the urine of all of them was ſtrongly impregnated, but in the blood of one of theſe only could it be perceived by the ſmell. I have very often adminiſtered carbonate of potaſh, and ſoda alkalies in ſuch quantities, that the urine efferveſced with acids; and I precipitated from urine, containing potaſh alkali, ſupertartite of potaſh, on adding tartareous acid. In one trial I adminiſtered 800 grains of carbonate of potaſh in water, ſuperſaturated with carbonic acid, between the hours of ten o'clock at night and two the following day in the afternoon. Blood was drawn at twelve on that day, and at which time urine was excreted impregnated with alkali, as juſt mentioned, but not a trace of this ſalt could be detected in the ſerum by the teſts of violet juice, and of turmeric.

Nitrate of pot-aſh has been given in large quantities, but it could not be traced in the blood, although it was readily detected in the urine.

5. If the Diabetes be eſſentially an organic diſeaſe of the kidneys, one might expect to ſee always ſuch a diſeaſed ſtate on diſſection; which, however, could not be perceived in Laurie's caſe above related. There are alſo diſſections publiſhed by various perſons, in a few of which only was any diſeaſe ſeen in the kidneys; nor are there, in general, any complaints of the loins, urinary paſſages, hips, &c. in diabetic caſes. Wherefore, if organic affection takes place, it ſhould be conſidered as an accidental attendant, or conſequence; and in this light ſhould be regarded the diſeaſed ſtate of the liver, ſpleen, lungs, &c. obſerved in ſome inſtances. At the moſt, ſuch organic diſeaſe can only be conſidered as productive of one ſpecies of Diabetes, in which, on examination, it is probable the urine will be found to be very different from that in the other ſpecies of this diſeaſe.

The ſtate of the meſentery ſhould be more accurately attended to on diſſection of diabetic patients. In Laurie's caſe above deſcribed, it was obſerved to be diſeaſed, but I was not prepared at that time for examination of this part with a view to any theory. The urine ought alſo to be examined after the death of the patient, as well as while alive. In ſome caſes, as the appetite fails the urine diminiſhes in quantity, and loſes its ſweetneſs a ſhort time before death.

The theory that Diabetes is a diſeaſed ſtate of the aſſimilatory organs, accounts for ſome of its moſt characteriſtic ſymptoms; namely, for the urine containing ſugar and other nutritious matters, the waſting of the fleſh, frequent diſcharges of urine, thirſt, hunger, weakneſs of the organs of voluntary action, &c. but it does not account for the quantity of urine much exceeding the quantity of drink. In ſome inſtances, the exceſs may be accounted for by reckoning the quantity of water contained in the ſolid food, and which amounts to much more than has been uſually calculated, or conceived. But in other caſes, taking the water contained in ſuch food into the reckoning is not ſufficient to account for the quantity of urine; and in ſuch caſes ſome addition may, on reaſonable grounds, be conſidered to be made by the waſte of the conſtitution of the patient. Water may alſo be compounded in the blood veſſels, or other veſſels; the conſtituent parts of it exiſting in all the fluid and ſolid parts of the animal œconomy; but that ſuch a proceſs goes forward is a mere hypotheſis; and granting that in reality there is ſuch a proceſs, the ſupply of a large quantity of water by means of it cannot long continue, without ſymptoms of diſeaſe appearing.

In ſome inſtances the quantity of urine is much greater than can be accounted for from all theſe ſources united. Caſes are recorded in which twenty-five to thirty, and more pints, were diſcharged in the ſpace of a natural day for many ſucceſſive weeks, and even months; and in which the whole ingeſta, as was ſaid, did not amount to half the weight of the urine. The evidences for ſuch caſes are ſo numerous and reſpectable, that we cannot refuſe to admit them; but, I confeſs, it does not appear to me that the quantities of drink have been fairly calculated; and if they had been ſo, it ſeems probable that the urine would not have ſo greatly exceeded the quantity of liquids ſwallowed, nor would birth have been given to ſeveral hypothetical and analogical explanations of the ſuppoſed ſuperabundant quantity of water diſcharged to that of the drink. The explanation that water is abſorbed by the ſkin from the air has been very generally accepted; but this has no better ſupport than the analogy of the deliqueſcence of certain ſalts; and no experiments have demonſtrated that water is abſorbed from the air by the ſurface of the body. Another hypotheſis, which has great ingenuity to recommend it, is, that an extraordinary quantity of water is compounded in the lungs themſelves. I do not know the facts which countenance ſuch a conjecture: nor in the 1ſt place, am I able to conceive that the proceſs of the compoſition of water can go forward in the lungs to ſo great an amount, without any ſymptoms of it making their appearance in the pulmonic ſyſtem. 2dly. Granting that in 24 hours there is an augmentation of more than eight pounds of oxygen gas inſpired, which there muſt be to compound ten pound of water (where that quantity is to be accounted for) and ſuppoſing the ingeſta to be able to furniſh two pound of hydrogen, is it conſiſtent that ſo large a quantity of oxygen gas can part with its caloric without a very extraordinary increaſe of the temperature of the animal œconomy? Or, indeed, be ſeparated conſiſtently with life?

I take leave, to cloſe this paper, with a few remarks on the cure of the pulmonary conſumption in the caſe before us.

1. Was this change effected by the warm weather of the Summer ſeaſon? This certainly was not the only mean, for the diſeaſe had returned every ſucceſſive Winter for ſeveral years with aggravated ſymptoms. The Summer ſeaſon, however, might contribute with,

2dly, The diſcharge by the kidneys, by which the plethoric and inflammatory ſtate of the lungs was leſſened.

3dly. It ſeems but equitable to impute the recovery, at leaſt in part, to the hydrocarbonate gas; in whatever way it might operate. But,

4thly. Ought not a great deal to be imputed to the emaciation which took place, during which proceſs much of the matter of the conſtitution itſelf was abſorbed, and, of courſe, the diſeaſed ſtate of the lungs might be particularly altered? The waſting of the fleſh ſeems to have been beneficial in this inſtance. And, although the patient does not enjoy the firm and vigorous health he formerly did, yet his valetudinary ſtate is not uncomfortable.